TINKHAM
8.3
11945

FIVE YEAR REVIEW

TINKHAM GARAGE SUPERFUND SITE
LONDONDERRY, NEW HAMPSHIRE

CERCLIS ID. #NHD062004569

Prepared by:

U.S. Environmental Protection Agency
Region 1
Boston, Massachusetts

March 1999

11945

I. Introduction

Purpose

EPA Region I performed a five-year review of the Tinkham Garage Site pursuant to CERCLA section 121(c), NCP section 300.400(f)(4)(ii), and OSWER Directives 9355.7-02 (May 23, 1991), and 9355.7-02A (July 26, 1994). It is a policy review because unrestricted use of the property will be allowed once groundwater remedial action objectives are achieved. The purpose of this five-year review is to ensure that the remedial action remains protective of public health and the environment and is functioning as designed. This document will become a part of the Site file. This report is a Type I level review which is appropriate at sites where circumstances which may compromise protectiveness are not present.

Site Characteristics

The Tinkham Garage Site encompasses 375 acres of residential and undeveloped land located near the intersection of routes 93 and 102 in Londonderry, New Hampshire. The Site study area is bounded by route 102 to the north, Gilcreast Road to the east, Ross Drive to the south, and the Woodland Village Condominium Complex to the west (see attached figure). Undeveloped portions of the Site feature wooded areas, open fields and wetlands. The Site topography slopes generally to the south and west. Developed areas include single family homes along Mercury and MacAllister Drives and a 400-unit condominium complex. Developed areas of the Site were connected to a public water supply in 1983.

Site History

The Site was discovered in 1978 when complaints of foam and odors on a small unnamed brook were reported to the Londonderry Health Department. Their investigation concluded that tank and truck washings dumped directly on the ground behind the Tinkham Garage building was the source of the foam and odors. The New Hampshire Department of Environmental Services (DES) ordered a removal of all surface contamination. Additionally, a diversion trench was excavated to prevent further contaminant migration into an unnamed brook.

EPA involvement began in 1981 as a result of further citizen complaints. EPA sampled supply wells in the area and found that two wells, which served the Woodland Village Condominium Complex, and a number of private residential wells contained volatile-organic compounds (VOCs) at concentrations which exceeded drinking water wells. EPA supplied bottled water to affected residents until the permanent public water line was jointly completed by EPA and DES in 1983. The Tinkham Garage Site was finalized on the National Priorities List (NPL) in September 1983.

The remedial investigation concluded that overburden and bedrock aquifers were contaminated with volatile and extractable organic compounds. The sources of the groundwater contamination were determined to be an area of surface soil contamination behind the Tinkham garage building

and potential additional areas in the Woodland Village Condominium Complex. All sources are believed to have originated from tank and truck washings.

A Record of Decision (ROD) was approved on September 30, 1986 and called for excavation of about 10,800 cubic yards of soil from behind Tinkham Garage and treatment by either aeration, composting or soil washing. Soil from the Woodland Village Condominium Complex was to be evaluated further. Groundwater was to be extracted and pumped to the Derry Publicly Owned Treatment Works (POTW), with possible on-site pre-treatment.

On September 11, 1987, EPA entered an Administrative Consent Order which required the potentially responsible parties (PRPs) to perform pre-design studies to evaluate soil treatment technologies and determine the full extent of soil and groundwater contamination. The pre-design study concluded that vacuum extraction was the preferred soil treatment technology, that 9,000 yd^3 of contaminated soil required treatment (including soil behind the garage and from two leach fields and a pile in the condominium complex), and that two bedrock supply wells located in the Woodland Village Condominium Complex are hydraulically connected to the contaminated shallow aquifer behind Tinkham Garage.

Based on results of the pre-design study performed by the PRPs, an Amended ROD was approved on March 10, 1989 which called for all contaminated soils from the garage and condominium areas be treated by vacuum extraction and that groundwater remediation be performed by simultaneously extracting groundwater from the shallow aquifer near the source area behind Tinkham Garage and from two bedrock supply wells located in the condominium complex. The shallow groundwater extraction and soil remediation would be accomplished by a dual-phase vacuum extraction system (DVE). Treatment would be performed by the Derry POTW. Initial on-site pre-treatment of groundwater would be necessary. Groundwater remediation would continue until drinking water standards were obtained for all VOCs. The primary groundwater contaminants were trichlorethylene and tretrachloroethylene. Implementation of this remedy required extension of a municipal sewer line from the Town of Derry.

Delays in the sewer line extension lead EPA to issue an Explanation of Significant Differences (ESD) on January 21, 1992. The ESD required the PRPs to construct an on-site treatment and recharge system for groundwater rather than relying on construction of a sewer line to initiate remedial activities. In response, the PRPs performed a Subsurface Groundwater Infiltration Study in March 1992. Results of the study concluded that on-site recharge at the required flow rates was not feasible. However, following issuance of the ESD, an agreement between the towns of Londonderry and Derry was reached and construction of the sewer line began in March 1993. Significant progress in construction of the sewer line allowed on-site soil remediation to begin in March 1994. Initial work involved sampling and consolidation of soils. Active DVE remediation began in November 1994.

The DVE system achieved soil clean-up goals in September 1995. In November 1995, the groundwater extraction system was modified to operate independent of the former VE system. Pre-treatment was also determined to be no longer necessary and was removed. Direct pumping of groundwater to the Derry POTW continues from six shallow wells in the former source area behind Tinkham garage and from two former bedrock supply wells in the condominium complex.

II. Remedial Action Objectives

EPA's primary responsibility at this Site, and all Superfund sites, is to undertake remedial actions that are protective of human health and the environment. In addition, Section 121 of CERCLA establishes several other statutory requirements and preferences, including a requirement that EPA's remedial action, when complete, must comply with all federal and more stringent state environmental standards, requirements, criteria or limitations. Response alternatives were developed to be consistent with these requirements.

Remedial action objectives were developed to aid in the screening of source control and management of migration response alternatives and were developed to mitigate existing and future potential threats to public health and the environment. The remedial action objectives for source control were:

1. Mitigating further release of contaminants to the surrounding environmental media and

2. Eliminating or minimizing the threat posed to public health, welfare and the environment from the source area.

The Amended ROD stated that vacuum extraction would be performed until contaminant levels in soil were reduced to a level of 1 mg/kg total VOCs or less. The source control remedy was performed by Terra Vac and was completed in September 1995. Confirmatory soil sampling verified compliance with the remediation objective.

The remedial objectives for management of migration are:

1. Mitigating further migration of contaminants beyond their current extent and

2. Eliminating or minimizing the threat posed to public health, welfare and the environment from the current extent of contaminant migration.

The Amended ROD stated that groundwater extraction and treatment will continue until remediation goals of 5 ppb of TCE and PCE are attained in every well on-site and a determination is made that water quality is protective of human health and the environment. In

order for a protectiveness finding to be made, drinking water standards will need to be achieved throughout the plume area.

In general, progress has been made towards achieving remedial goals in groundwater. With successful completion of the source control remedy, levels of VOCs in the former source area behind Tinkham garage have exhibited a downward trend in overburden and bedrock wells, particularly in the originating compounds. Some increase in concentration of daughter products has been observed, as expected, indicating active bio-degradation. The table below demonstrates the change in concentrations, for contaminants which exceed drinking water standards, at key monitoring wells.

MW	Date		1,1 PCE ppb		1,1 TCE ppb		cis 1,2 DCE ppb		1,2 DCA ppb		Vinyl Chloride ppb		benzene ppb	
Cleanup Level	1994	1998	5 ppb		5 ppb		70 ppb		5 ppb		2 ppb		5 ppb	
FW11D			**6**	4	**22**	**36**	9	53	-	**16**	-	**17**	-	3
OW2D			-	-	-	**30**	**760**	**600**	**150**	**90**	-	-	-	-
NAI-K2			**120**	**9**	**760**	**44**	**490**	**160**	-	2	-	**6**	-	2
NAI-M1			**49**	3	**89**	**6**	**180**	13	**8**	2	**190**	7	**8**	2
NAI-M2			-	-	**6**	-	33	4	**10**	-	**130**	**5**	**12**	2
DVE-7*				**20**		**110**		40		-		-		-
LGSW			-	-	-	-	-	3	-	2	-	**5**	**10**	**9**
ERT01			-	-	**16**	**16**	7	11	-	-	-	-	-	-
FW21D			-	-	-	-	29	10	-	-	-	2	-	4
MPI3S-R			-	-	-	2	5	13	-	6	-	-	-	8

- below detection limit
Cleanup levels - federal MCLs or state AGQSs
Shaded columns are most recent November 98' data
Bold data exceed groundwater cleanup standards
* - DVE-7 was not sampled until 1995
FW11D, LGSW, FW21D and MPI3S-R are bedrock wells

As shown in the table above, drinking water standards continue to be exceeded in several overburden and bedrock wells. Most are minor exceedances, with the exception of wells OW2D and NAI-K2, which are overburden wells located in the former source area. However, decreasing trends are apparent in these wells, as demonstrated in the most recent annual groundwater monitoring report. Active extraction of groundwater from the overburden aquifer in the former source area continues. Extraction of groundwater from the bedrock aquifer was discontinued since, in general, contaminant concentrations are far lower in the bedrock aquifer and the PRPs demonstrated active biodegredation is occurring. The shallow and bedrock plumes have not expanded in size and future plume migration is unlikely. Annual and semi-annual groundwater monitoring will continue to be performed. Neither aquifer is used as a drinking water source.

Institutional Controls

A majority of the Tinkham Site remains undeveloped. However, the current owner is actively seeking to develop the buildable portions of the Site property and it is anticipated that a mix of commercial and residential development will occur in the upcoming year. As a condition for development, and consistent with the 1986 ROD (as amended), institutional controls are necessary which will prevent the use of on-site aquifers.

As stated in Section I above, developed portions of the Site are connected to a public water supply as a sole source of drinking water. Some residences do utilize well water for not-potable uses such as irrigation. Based on current VOC levels in the aquifer, this is an allowable use since the only potential risk is from direct ingestion of groundwater. The property owner has agreed to place deed restrictions on the undeveloped portions of the property, prior to development, stating that "on-site water not be used as a potable source."

III. ARARs Review

The primary applicable or relevant and appropriate requirements (ARARs), as listed in the ROD, include the chemical-specific group. Location and action-specific ARARs included in the ROD were complied with during active DVE construction and operation.

Numerous federal and state chemical-specific ARARs are included in Appendix C of the Amended ROD. The primary ARARs which are relevant to the ongoing groundwater remediation, include:

- Federal Maximum Concentration Limits (40 CFR ϕ 264.94)
  - states that groundwater throughout the plume will attain these standards
- Federal Clean Air Act (40 CFR Part 50)
  - states that the selected clean-up action must not exceed air standards
- New Hampshire Primary Drinking Water Standards (Env-ws Parts 315 - 319)
  - states that groundwater throughout the plume will attain these standards

Progress is being made towards achieving the standards included in the above-listed ARARs (i.e, federal and state drinking water standards.) Active extraction of groundwater from the overburden aquifer in the former source control area continues. Extraction of groundwater from the bedrock has been discontinued since contaminant concentrations have been reduced to levels which are at or near drinking water standards. Active biodegredation is present in both aquifers.

Additionally, Executive Order 11990 - Protection of Wetlands, was listed in the ROD and required that remedial activities avoid degradation of on-site wetlands. During performance of the DVE system, water levels were closely monitored to assure the hydrology of the wetlands were not compromised. Silt fencing and hay bails were used during the soil consolidation activities to prevent runoff.

IV. Summary of Site Visit

On March 12, 1999, EPA and NHDES inspected the Tinkham Garage Site specifically to determine if any changes had occurred at, or in the vicinity of the Site which would bring the protectiveness of the remedy into question. James DiLorenzo from EPA and Paul Lincoln from NHDES participated.

Conditions at the Site remain as they were at completion of active remediation in September 1995. The former source area and excavated areas from the condominium complex were not visible during the Site visit because of snow cover, however, previous observations confirm these areas are now fully vegetated. A conversation with the property owner, Judy Tinkham, confirmed that development of the property is being planned. Ms. Tinkham has indicated that she intends to place groundwater use restrictions on the property prior to development. A subsequent phone conversation with the Town's Engineer, Gary Tendler, confirmed that any development which occurs at the Site will be required to connect to public drinking water and sewer services.

V. Areas of Non-Compliance

None noted.

VI. Recommendations

Based on this five-year review and information contained in the most recent groundwater monitoring report, the following actions are recommended:

1. The current annual/semi-annual groundwater monitoring program should continue; and

2. Deed restrictions should be placed on affected properties prior to development.

VII. Statement of Protectiveness

I certify that the remedy selected for the Tinkham Garage Site remains protective of human health and the environment. The recommendations listed in Section VI above are necessary to ensure this protectiveness finding remains valid.

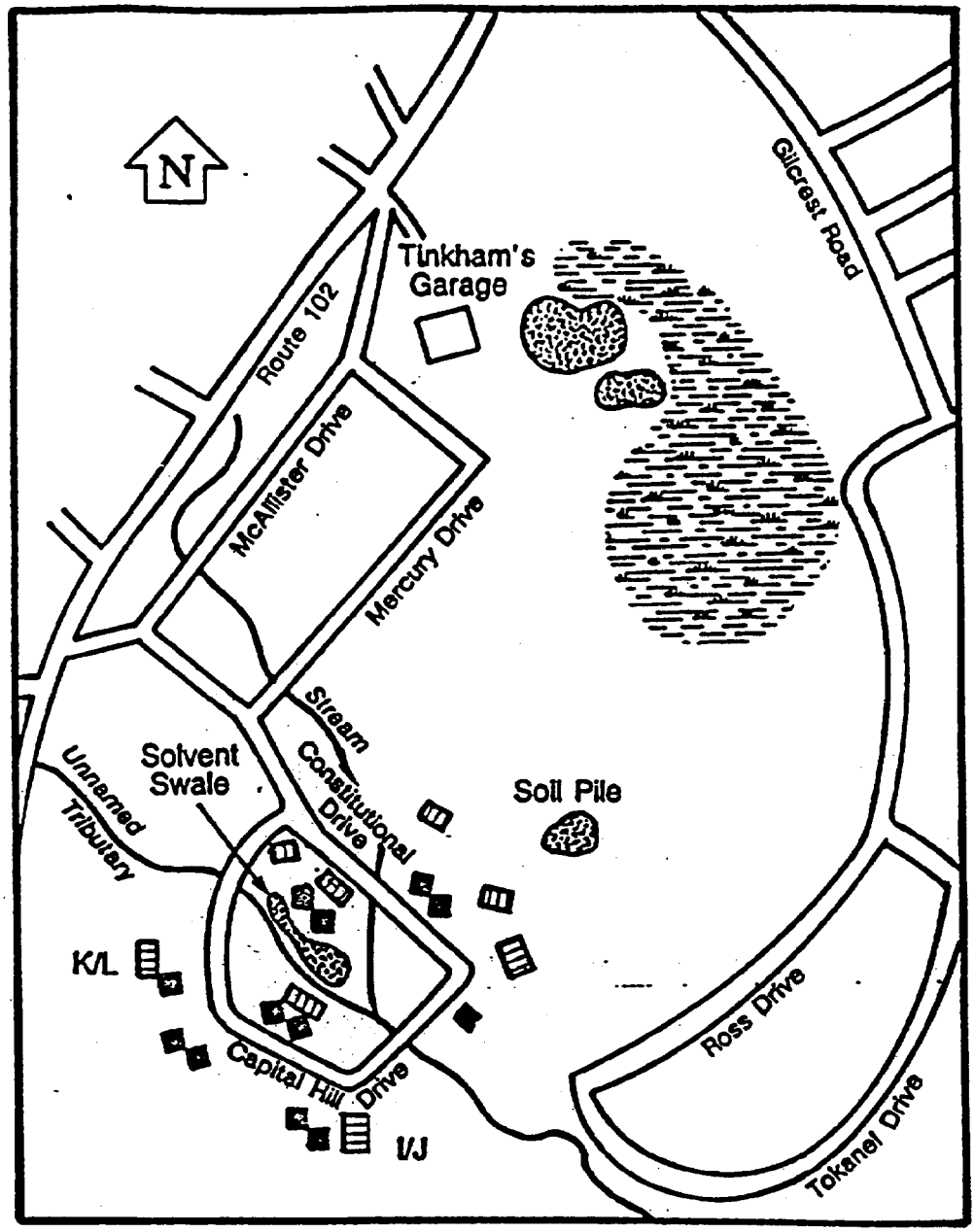
VIII. Next Five-Year Review

Consistent with OSWER Directive 9355.7-02A, the next five-year review will be conducted by March 2004.

Patricia L. Meaney, Director — Date

Office of Site Remediation and Restoration, Region 1

Figure 1: Map of Study Area, Tinkham's Garage Site, Londonderry, NH



LEGEND

- Woodland Village Condominium Buildings
- Leachfields for Condominiums
- Areas of Soil Contamination (prior to 1995)
- Wetlands